

What is claimed is:

- 1 1. A method, comprising:
2 receiving a first schema database comprising information having at least one
3 of a spatial component and a remaining component;
4 performing data analysis thereon to determine a geospatial pattern based upon
5 the spatial component;
6 storing the geospatial pattern as meta data;
7 aggregating data of the database into one or more groupings in accordance
8 with the meta data; and
9 displaying one or more indicators associated with the one or more groupings
10 on an n-dimensional presentation.
- 1 2. The method of claim 1, further comprising:
2 analyzing at least a portion of at least one dataset included by the database to
3 determine at least one relationship among the groupings; and
4 displaying one or more indicators to denote the relationship(s) among the one
5 or more groupings.
- 1 3. The method of claim 1, further comprising:
2 forming a virtual schema meta model based upon at least a portion of at least
3 one dataset included by the database; and
4 wherein the aggregating data of the database comprises aggregating data of
5 the database into one or more groupings in accordance with the virtual schema.
- 1 4. The method of claim 1, further comprising:
2 receiving an input indicating a criterion;
3 storing the input as meta data; and
4 aggregating data of the database into new groupings in accordance with the
5 meta data.
- 1 5. The method of claim 4, wherein the input comprises at least one of:
2 an input from a user,

3 a defined area,
4 a derivation based upon one or more objects on the n-dimensional
5 presentation,
6 a machine defined meta data; and
7 a result of a computation.

1 6. The method of claim 5, wherein:
2 the defined area comprises at least one of:
3 a zip code,
4 an area code,
5 a census tract,
6 a Metropolitan Statistical Area (MSA),
7 a nation state,
8 a state,
9 a county,
10 a municipality,
11 a plat;
12 a voting district;
13 a precinct;
14 a latitude, and
15 a longitude.

1 7. The method of claim 5, wherein:
2 the derivation based upon one or more objects on the n-dimensional
3 presentation comprises at least one of:
4 a sales territory,
5 a 5-mile radius from a school,
6 a 10 feet right of way along a street; and
7 a region within a specified distance of a power line.

1 8. The method of claim 5, wherein:
2 the result of a computation comprises:

3 computing an animal home range, the home range providing a region defined
4 by activities of a target;
5 defining within the region a first ellipse; and
6 defining within the region a second ellipse approximately orthogonal to the
7 first ellipse; wherein
8 an area defined by intersection of the first ellipse and the second ellipse
9 provides a greatest probability of finding the target.

1 9. The method of claim 8, wherein:
2 the target comprises at least one of:
3 a suspect, who perpetrated criminal acts defined by the data,
4 a customer, who completed transactions in shops defined by the data,
5 a source of biological material, which caused infections in persons defined by
6 the data,
7 a source of pollution.

1 10. The method of claim 1, wherein meta data is stored according to a
2 hierarchy.

1 11. The method of claim 1, further comprising:
2 creating a data cube report for at least a portion of a dataset in the data
3 warehouse;
4 reducing the data cube report by aggregation to at least one tuple, comprising
5 a GIS-object and a data point;
6 storing the GIS-object as metadata; and
7 aggregating like tuples for display on the n-dimensional presentation.

1 12. The method of claim 1, wherein data analysis further comprises at
2 least one of
3 data mining;
4 spatial relationship data analysis;
5 clustering;
6 statistical analysis; and

7 regression analysis.

1 13. The method of claim 1, wherein:

2 aggregating the groupings based upon the spatial-object meta data comprises:
3 checking whether data points fall within a common region, and
4 if so, aggregating data represented by the data points.

1 14. The method of claim 2, further comprising:

2 receiving a second input indicating one or more redefined regions;
3 storing the second input as a redefined spatial-object meta data; and
4 aggregating into new groupings based upon the spatial-object meta data.

1 15. The method of claim 3, further comprising:

2 redefining the virtual schema based upon the spatial-object meta data,
3 comprising:
4 receiving a second input indicating a criteria;
5 aggregating data of the database into one or more new groupings in
6 accordance with the redefined virtual schema and the second input indicating the criteria; and
7 displaying one or more indicators associated with the one or more new
8 groupings on an n-dimensional presentation.

1 16. The method of claim 3, further comprising:

2 receiving a second input indicating a relationship between a first data point
3 and a second data point on the n-dimensional presentation;
4 reflecting the relationship in the virtual schema;
5 aggregating data of the database into one or more new groupings in
6 accordance with the virtual schema; and
7 displaying one or more indicators associated with the one or more new
8 groupings on an n-dimensional presentation.

1 17. The method of claim 1, further comprising:

2 receiving a second database;

3 forming a virtual schema including at least a portion of a dataset included
 4 within at least one of the first database and the second database;
 5 receiving a first input indicating a criteria;
 6 aggregating data of at least one of the first database and the second database
 7 into one or more groupings in accordance with the virtual schema and the first input
 8 indicating the criteria; and
 9 displaying one or more indicators associated with the one or more groupings
 10 on an n-dimensional presentation.

1 18. A method, comprising:
 2 receiving a first schema database comprising information having at least one
 3 of a spatial component and a remaining component;
 4 performing data analysis thereon to determine a geospatial pattern based upon
 5 the spatial component;
 6 storing the geospatial pattern as meta data;
 7 forming a virtual schema including at least a portion of a dataset included
 8 within the first database;
 9 aggregating data of the database into one or more groupings in accordance
 10 with the virtual schema and the meta data; and
 11 displaying one or more indicators associated with the one or more groupings
 12 on an n-dimensional presentation.

1 19. A system, comprising:
 2 a schema builder that generates one or more virtual schemas including at least
 3 a portion of data input from a source, and generates mapping rules controlling data
 4 movement into a data warehouse;
 5 a metadata repository operative to hold the virtual schemas and mapping
 6 rules;
 7 a region checker;
 8 a data analyzer; and
 9 an n-dimensional presentation;

10 wherein the data analyzer is operative to create at least one mapping rule
11 based upon analysis of information in the data warehouse.

1 20. The system of claim 19 wherein:

2 the source comprises at least one of a plurality of on line transaction
3 processing (OLTP) databases.

1 21. An apparatus, comprising:

2 means for generating one or more virtual schemas including at least a portion
3 of data input from a source;

4 means for performing data analysis on the data to determine a geospatial
5 pattern based upon the spatial component;

6 means for storing the geospatial pattern as meta data;

7 means for generating one or more analysis functions based upon the virtual
8 schemas and data input; and

9 means for displaying an aggregated grouping of data in an n-dimensional
10 presentation based upon the virtual schema and the meta data.

1 22. A computer program product, comprising:

2 code for receiving a first schema database comprising information having at
3 least one of a spatial component and a remaining component;

4 code for performing data analysis thereon to determine a geospatial pattern
5 based upon the spatial component;

6 code for storing the geospatial pattern as meta data;

7 code for aggregating data of the database into one or more groupings in
8 accordance with the meta data;

9 code for displaying one or more indicators associated with the one or more
10 groupings on an n-dimensional presentation; and

11 a computer readable storage medium for holding the codes.

1 23. A customer data analysis report produced according to the method of
2 claim 1.